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NOTES AND NEWS

Fly Pollination of Penstemon davidsonii and P. procerus (Scrophulariaceae).—Agents implicated as pollinators of various species of *Penstemon* include: hummingbirds, coleopterans, carpenter bees, honeybees, bumblebees, solitary bees, masarid wasps, bee flies, syrphid flies, moths, and many other hymenopterans, dipterans, and lepidopterans (references below and: Clements and Long, Publ. Carnegie Inst. Wash. 336, 1923; Cooper, Amer. Midl. Naturalist 48:103–110, 1952; Merritt, Erythea 5:15–22, 1897; Robertson, Trans. Acad. Sci. St. Louis 25:277–324, 1927, *Flowers and insects,* 1928; Straw, Evolution 9:441–444, 1955 Amer. Naturalist 90:47–53, 1956). Heretofore, fly pollination of *Penstemon* has been described in

detail only by Straw (Ecology 44:818–819, 1963), although there are many incidental citations, especially in the older literature (see Knuth, *Handbuch der Blütenbiologie,* Bd. 3, Tl. 2, 1905, *Handbook of flower pollination,* Vol. 3, 1909). The purpose of the present note is to extend records on pollination of *Penstemon* to an additional species, *P. procerus* Dougl. ex Grah., and for this species and *P. davidsonii* Greene ssp. *davidsonii* (vouchers in UC as *Schmid 1975–21* and *1975–20,* respectively), also to a new geographic region (Oregon). Pollination by bees (Knuth, op. cit., 1905, for cultivars in Europe) has been reported for *P. menziesii* Hook. [a nomenclaturally illegitimate name relegated to the synonymy of *P. davidsonii* as ssp. *menziesii* Keck (Keck and Cronquist, Brittonia 8:247–250, 1957)], whereas pollination by bumblebees (Baker and Baker, New Phytol. 76:87–98, 1976) and hummingbirds (Grant and Grant, *Hummingbirds and their flowers,* 1968) has been reported for *P. davidsonii* ssp. *davidsonii* [= *P. menziesii* Hook. ssp. *davidsonii* (Greene) Pennell].

The flies (specimens deposited in UC Berkeley Insect Collection) observed visiting flowers of *Penstemon* were *Allograpta* sp. (Syrphidae) on *P. procerus* (fig. 1) and

Fig. 1 A syrphid fly (*Allograpta* sp.) visiting *Penstemon procerus.*

Hylemya alcathoe Walker (Anthomyiidae) and *Hilara* sp. (Empididae) on *P. davidsonii.* Both plant species were growing in profusion along Highway 242, about 2 km west of McKenzie Pass, 1624 m, Deschutes Co., Oregon. Activities of the insects conformed in general to observations of previous workers (references above and below) on other species of *Penstemon.* Each fly spent several minutes either on or, especially, in a flower, and each also visited successively several flowers of a species. This mode of operation of the insects presumably would be adequate for cross-pollination (data on xenogamy versus geitonogamy were not collected). Since *P. davidsonii* has both stamens and style included, an insect must completely enter the corolla tube to effect pollination. No insects other than flies were sighted on the flowers during my observations, which were made in late afternoon of 20 Aug 1975.

The syrphid flies ate pollen and seemed to take nectar from the flowers. The latter was not actually seen since the nectariferous hairs are concealed within the tubular corolla, being borne on the bases of the upper pair of stamens (Straw, Phytomorphology 6:112–119, 1956, Brittonia 18:80–95, 1966). In addition, the syrphid flies apparently glean stray pollen from the lower lip of *Penstemon procerus,* a procedure also observed by Crosswhite and Crosswhite (Amer. Midl. Naturalist 76:450–467, 1966) for syrphids visiting other species of the genus. Syrphids, it might be noted, have been observed taking both nectar and especially pollen from flowers of many other plant families (Schmid, Principes 14:39–49, 1970).

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Range Extensions of Three Conifers and a Dwarf Mistletoe in the Panamint Mountains, Death Valley National Monument.—The ranges of three conifers, *Pinus aristata* Engelm. (syn. *P. longaeva* D. K. Bailey) (*Johnson 73311–1,* IFGP), *P. flexilis* James (*Johnson 73311–3,* IFGP), and *Juniperus occidentalis* Hook. (*Johnson 73311–5,* IFGP), extend farther south in the Panamint Mountains than heretofore reported by Griffin and Critchfield (*The distribution of forest trees in California,* USDA Forest Serv. Res. Pap. PSW-82. 1972). On 7 Nov 1973, I climbed Sentinel Peak (2937 m) by way of Panamint Pass. I was investigating a report that *P. jeffreyi* Grev. & Balf. grew on the southwest slope of the peak in the Panamint Range on the western border of Death Valley National Monument. I did not find *P. jeffreyi* but extended the range for the three conifers to Sentinel Peak, which is 8.2 km south of the well-known bristlecone pine stand on Telescope Peak (3368 m). Sentinel Peak's climbing register shows that the mountain has often been climbed. And yet the occurrence of bristlecone pine—an easily recognized and highly publicized species—has until now gone unreported for this desert peak. While on a second expedition to the Panamint Range in April 1975, I found a further extension of *P. flexilis* (*Johnson 75116–1,* IFGP) to Porter Peak (2774 m), 5.5 km south of Sentinel Peak.

Death Valley and vicinity have been repeatedly "botanized". The earliest comprehensive botanical reconnaissance of this area was the U. S. Department of Agriculture's Division of Botany biological survey in 1891 (Coville, Contr. U.S. Natl. Herb. 4:1–363. 1893; Merriam, North American Fauna 7:285–343. 1893). The expedition collected bristlecone pine on Telescope and White Mountain Peaks in California and on Charleston Peak, Nevada. In February 1891, Coville (op. cit.) and Funston crossed the Panamint Mountains in a "terrific snowstorm". They were within sight of the Sentinel Peak bristlecone pine stand but were apparently more concerned with their own survival than with observing plants. They crossed Panamint Pass in late February 1891, but a heavy snowpack may have prevented their scouting the area south of the pass. In March 1891, a reconnaissance party of the expedition made a base camp in Johnson Canyon just east of Sentinel Peak and ". . . excursions were made to various adjacent points". Even though they were camping in the shadow of Sentinel Peak, they did not detect the bristlecone pine stand.

The published distribution of bristlecone pine in the Death Valley area is confusing. Sudworth (*Forest trees of the Pacific slope,* 1908) reported bristlecone pine in the Panamint Range and later (*Geographic distribution of North American trees, Part I, pines,* 1913) mapped the Telescope Peak stand as the only grove on the mountains surrounding Death Valley. Subsequently, Sudworth (*The pine trees of the Rocky Mountain region,* 1917) added locations in the Cottonwood, Grapevine and Funeral Mountains. His original worksheet map (on file at the Pacific Southwest Forest and Range Experiment Station, Berkeley, California) shows that these range extensions are based on "Information furnished by District No. 5 [of the U. S. Forest Service]". According to Peter G. Sanchez, resource management specialist, Death Valley National Monument (pers. comm., June 1975), bristlecone pine has not been collected or found in the Cottonwood, Grapevine, or Funeral Mountains. Therefore, the information furnished by District No. 5 has never been corroborated.

Munns (*The distribution of important forest trees of the United States,* 1938) repeated the errors in his map book. Munz (*A California flora,* 1959, and *A flora of southern California,* 1974) perpetuated the report of bristlecone pine growing in the Grapevine and Funeral Mountains. Miller (Ecology 27:54–60. 1946) climbed Grapevine (2663 m) and Wahguyhe (2630 m) Peaks in the Grapevine Mountains, Nevada, and surveyed the surrounding area. He reported *Pinus flexilis* and *P. monophylla* Torr. & Frem. growing on these peaks. Miller thus confirmed the findings of Coville (op. cit.), who reported discovering *P. flexilis* on Grapevine Peak in 1891.

On Sentinel Peak, bristlecone pine grows in association with *Pinus flexilis, P. monphylla, Juniperus occidentalis,* and *J. osteosperma* (Torr.) Little, mainly above 2800 m.